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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/033,768

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Michael J. Tanguay

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08/25/2003

ATMI, INC.

7 COMMERCE DRIVE
DANBURY, CT 06810

EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,768

Applicant(s)

TANGUAY, MICHAEL J.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 25-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 and 50-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-24 and 50 in Paper No. 7 and 8 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10, 11, 13, and 20-23 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 10, 11, 20-23 recites the limitation "wafer holders". There is insufficient antecedent basis for this limitation in the claim.

5. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 requires "at least one of the wafer holders a diameter". Correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for

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patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11, 20-22, and 50-52 are rejected under 35 U.S.C. 102(e) as being anticipated by Suda et al (USPat. 6,053,980 A). Suda teaches:
- i. A wafer susceptor (90, wafer susceptor) for use in a substrate (5) processing system (Figure 1b, 2, 3), comprising:
 - a. at least one recess (mounting portions/recesses 92, 94) formed therein, wherein each recess (mounting portions/recesses 92, 94) is arranged and configured to hold one substrate (5) therein, at least one substrate comprises silicon ("glass"; column 31, lines 14-15)
 - b. Suda further teaches the material of construction of "first substrate holding means" is characterized by physical properties that match those of the substrate – "The heat resistant first substrate holding means is preferably made of quartz, glass, ..." (column 23, lines 27-36; column 16, lines 9-13), "Further, a glass substrate for a liquid crystal display element and the like can be used as the substrate." (column 31, lines 14-15), as claimed by claim 1 – Further, it has been established that apparatus claims must be structurally distinguishable from the prior art (In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) MPEP 2114).
 - ii. The wafer susceptor (90, wafer susceptor) of claim 1, wherein at least one substrate comprises silicon ("glass"; column 31, lines 14-15), as claimed in claim 2 - Further, it has been established that apparatus claims must be structurally distinguishable from the prior art

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(In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) MPEP 2114).

- iii. The wafer susceptor (90, wafer susceptor) of claim 1, wherein the physical properties (column 23, lines 27-36) comprise: Thermal coefficient of expansion; Reflectivity; Thermal mass; Thermal conductivity; Electrical resistivity; Dielectric constant; Dielectric loss; Density; Hardness; and Emissivity – It has been held that if the composition is physically the same, it must have the same properties. “Products of identical chemical composition cannot have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present (In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) MPEP 2112.01), as claimed in claim 3
- iv. a substrate processing system comprising at least one wafer susceptor as in claim 1, wherein said system further comprises an automated substrate transport assembly (80; Figure 5, 6a, 6b) arranged for transporting substrates into and out of a deposition chamber (56; Figure 5, 6a, 6b) in which said wafer susceptor is disposed, as claimed by claim 4
- v. The substrate processing system of claim 4, wherein said automated substrate transport assembly (80; Figure 5, 6a, 6b) is arranged for serially transporting single ones of a plurality of substrates into and out of said deposition chamber (56; Figure 5, 6a, 6b), as claimed by claim 5
- vi. the substrate processing system of claim 4, further comprising a substrate cassette (70; Figures 2, 3) for storage and bulk transport of plural arrays of substrates, and said substrate cassette (70; Figures 2, 3) is positioned in substrate pickup and substrate delivery

relationship to the automated substrate transport assembly (80; Figure 5, 6a, 6b), as claimed by claim 6.

- vii. the substrate processing system of claim 6, wherein said automated substrate transport assembly (80; Figure 5, 6a, 6b) comprises a wand array (see plural substrate holding means of 80; Figure 6B) comprising a plurality of wands (plural substrate holding means of 80; Figure 6B) constructed and arranged to simultaneously transport a corresponding plurality of substrates (two substrates 5 arranged vertically; Figure 6B) into and out of the deposition chamber (56; Figure 5, 6a, 6b), wherein the automated substrate transport assembly (80; Figure 5, 6a, 6b) and the substrate cassette (70; Figures 2, 3) are constructed and arranged so that when the automated substrate transport assembly (80; Figure 5, 6a, 6b) is translated into a pickup position relative to the substrate cassette (70; Figures 2, 3), said plurality of wands (see plural substrate holding means of 80; Figure 6B) engage and extract a plurality of substrates from the substrate cassette (70; Figures 2, 3), with each wand engaging and extracting a substrate from a different one of said plural arrays of substrates, and so that when the automated substrate transport assembly (80; Figure 5, 6a, 6b) is translated into a deposit position relative to the substrate cassette (70; Figures 2, 3), said plurality of wands release and deposit a plurality of substrates (5,70; Figure 6B) on the substrate cassette (70; Figures 2, 3), with each wand releasing and depositing a substrate into a different one of said plural arrays of substrates, as claimed by claim 7.
- viii. the substrate processing system of claim 4, wherein said automated substrate transport assembly (80; Figure 5, 6a, 6b) comprises a double-sided wand array (see plural substrate holding means of 80; Figure 6B) comprising a plurality of wands constructed and arranged

to simultaneously transport a corresponding plurality of substrates into and out of the deposition chamber (56; Figure 5, 6a, 6b), as claimed by claim 8

- ix. the substrate processing system of claim 4, further comprising a loadlock chamber (52; Figure 6B) including a multiparted (see plural wafers 5; Figure 6B) substrate cassette (70; Figures 2, 3) therein, and a transport arm (84; Figure 6B) arranged to selectively engage said multiparted substrate cassette (70; Figures 2, 3) and disengage from said multiparted substrate cassette (70; Figures 2, 3) in the loadlock chamber, as claimed by claim 9
- x. A substrate processing system comprising at least two (Figure 1B) wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) as in claim 1, an etch chamber (column 21, line 65 – column 22, line 7), and an automated transport assembly (80; Figure 5, 6a, 6b) arranged to:
 - a. (1) introduce one of said at least two wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) into a deposition chamber (56; Figure 5, 6a, 6b), while another of said at least two wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) is disposed in said etch chamber and regenerated thereby, and
 - b. (2) thereafter extract said at least two wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) respectively from the deposition chamber (56; Figure 5, 6a, 6b) and etch chamber, followed by introduction of one of said at least two wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) into the etch chamber from the deposition chamber (56; Figure 5, 6a, 6b), and introduction of another of said at least two wafer holders

(assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) into the deposition chamber (56; Figure 5, 6a, 6b) from the etch chamber, as claimed by claim 10 – it is noted in advance that it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- xi. the substrate processing system of claim 10, wherein at least one of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) has two recesses (92, 94 of 90; Figure 7, 5, 6A,B) therein, as claimed by claim 11
- xii. the substrate processing system of claim 10, further comprising an automated substrate transport assembly (80; Figure 5, 6a, 6b) and a substrate cassette (70; Figures 2, 3), wherein the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B), the automated substrate transport assembly (80; Figure 5, 6a, 6b), and the substrate cassette (70; Figures 2, 3) are constructed and arranged to simultaneously process two substrates, as claimed by claim 20
- xiii. the substrate processing system of claim 10, comprising a single wafer deposition chamber (56; Figure 5, 6a, 6b) sized for processing single substrates having a 200mm diameter, as

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claimed by claim 21 - Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- xiv. the substrate processing system of claim 21, wherein each wafer holder (90; Figures 7, 6A,B) is arranged and configured for placement inside said single wafer deposition chamber (56; Figure 5, 6a, 6b), and each wafer holder comprises a plurality of recesses (92,94) for holding substrates having a 100mm diameter, as claimed by claim 22 - Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 12-19, and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al (USPat. 6,053,980 A). Suda is discussed above. Suda does not teach:
- i. The substrate processing system of claim 10, wherein at least one of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) has four recesses therein, as claimed by claim 12
 - ii. The substrate processing system of claim 10, wherein at least one of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) a diameter in the range of from about 200mm to about 350mm, as claimed by claim 13
 - iii. The substrate processing system of claim 10, wherein at least one of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) has a diameter in the range of from about 200mm to about 300mm, as claimed by claim 14
 - iv. The substrate processing system of claim 10, wherein each of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) comprises recesses having a diameter in the range of from about 100mm to about 150mm, as claimed by claim 15
 - v. The substrate processing system of claim 10, wherein each of the wafer holders (assumed to be the wafer susceptor of claim 1; 90; Figures 5, 6,A,B) comprises recesses having a diameter in the range of from about 100mm to about 125mm, as claimed by claim 16

- vi. The substrate processing system of claim 10, further comprising a substrate cassette (70; Figures 2, 3) including slot members for positioning substrates in plural arrays, and wherein successive arrays are in side-by-side relationship to one another, as claimed by claim 17
- vii. The substrate processing system of claim 17, wherein the substrate cassette (70; Figures 2, 3) is constructed and arranged for holding two arrays of substrates, wherein all substrates are planar and each respective substrate in a first array is generally coplanar with a corresponding respective substrate in a second array, as claimed by claim 18
- viii. The substrate processing system of claim 18, wherein the first and second arrays are parallel to one another, as claimed by claim 19
- ix. The substrate processing system of claim 22, wherein each of the recesses in each wafer holder is circular, as claimed by claim 23

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add additional recesses to Suda's susceptor/wafer holder and to optimize the size and shape of Suda's recesses, including reproducing Suda's susceptor/wafer holder recess array such that they are positioned next to each other.

Motivation to add additional recesses to Suda's susceptor/wafer holder and to optimize the size and shape of Suda's recesses, including reproducing Suda's susceptor/wafer holder recess array such that they are positioned next to each other is to process variable sized wafers with increased processing area for a larger through-put of integrated circuits. Additionally, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart,

531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al (USPat. 6,053,980 A) in view of Nygaard, James L. (USPat. 3,765,763). Suda is discussed above Suda does not teach:

- xv. The substrate processing system of claim 20, further comprising a processor for programmable operating the automated substrate transport assembly (80; Figure 5, 6a, 6b) according to a cycle time program, as claimed by claim 24

Nygaard teaches:

- xvi. a substrate processing system (Figure 1,2) comprising a processor (16; column 3, lines 23-33) for programmable operation (column 3, lines 23-33) of the automated substrate (24) transport assembly (10) according means to control the cycle time (column 2, lines 12-15) by computer program, as claimed by claim 24

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add cycle time computer control to Suda's substrate processing system as taught by Nygaard. Motivation to add cycle time computer control to Suda's substrate processing system as taught by Nygaard is to control and minimize cycle times (column 1, lines 21-28).

Response to Arguments

11. Applicant's arguments filed May 22, 2003 have been fully considered but they are not persuasive.

12. Applicant states that Suda does not teach "using a wafer holder that has physical properties that match with those of the substrate to be processed". Applicant is directed to the body of the above anticipation claim rejection under Suda:

13. Suda further teaches the material of construction of "first substrate holding means" is characterized by physical properties that match those of the substrate – "The heat resistant first substrate holding means is preferably made of quartz, glass, ..." (column 23, lines 27-36; column 16, lines 9-13), "Further, a glass substrate for a liquid crystal display element and the like can be used as the substrate." (column 31, lines 14-15), as claimed by claim 1 – Further, it has been established that apparatus claims must be structurally distinguishable from the prior art (In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) MPEP 2114).

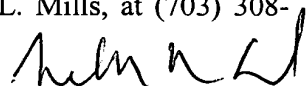
14. Claims directed to the material of use for the substrate do not limit the claimed apparatus. It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does ." (emphasis in original) Hewlett - Packard Co . v. Bausch & Lomb Inc ., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114). Further, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Exparte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Conclusion

15. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.



JEFFRIE R. LUND
PRIMARY EXAMINER